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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of SINGH et al.

Application No.: 10/081,979

Examiner: Marcheschi, Michael A.

Date Filed: February 22, 2002

Group: 1755

For: CHEMICAL-MECHANICAL POLISHING SLURRY
FOR POLISHING OF COPPER OR SILVER FILMS

CERTIFICATE UNDER 37 CFR 1.8(a)
I hereby certify that this correspondence is being deposited with the U.S.
Postal Service as First Class mail in an envelope addressed to the
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
on June 14, 2004.

Neil R. Jetter

Reg. No. 46,803

DECLARATION UNDER 37 C.F.R. §1.131

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Commissioner for Patents
P.O. box 1450
Alexandria, VA 22313-1450

Sir:

I, Rajiv K. Singh, declare:

1. I am a named inventor of the subject matter claimed in the above-captioned application.
2. I have read the Office Action mailed February 13, 2004.
3. I have been employed by University of Florida since before March 2001.

4. I was one of the inventors which conceived of the above-entitled invention in the United States prior to the earliest effective filing date of January 17, 2002 that I have been advised may be afforded to U.S. Pat. No. 6,656,369 to Krishnan.

5. Before January 17, 2002, I, along with my co-inventor, Seung-Mahn Lee conceived of the claimed subject matter. Pages from my laboratory notebook dated March 25, 2001 which clearly describe the claimed invention are attached hereto and marked as Exhibit "A".

Declarant further states that all statements made herein are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 6/14/04

Rajiv K. Singh

Dr. Rajiv K. Singh

PROPRIETARY

NOTEBOOK CONTROL INFORMATION

COMPANY NAME University of Florida

SECTION _____

CONTROL (NOTEBOOK) NUMBER 1

ASSIGNED TO Rajiv Singh

SIGNATURE Rajiv Sg

ISSUE DATE March 20 '01 LAST ENTRY _____

OLD CONTROL NUMBER not given

NEXT CONTROL NUMBER _____

ASSIGNED BY Rajiv Sg

TOTAL PAGES DATA ENTERED _____

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PROJECT NAME CMP of CopperNOTEBOOK NO. 1

We discussed with Seun-Mahn Lee on further development on copper CMP polishing

Experiment with no abrasive in the slurry.

Type of experiments to be completed

Slurry I (Low Removal Rate (LRR)) consisting of $10^{-2} N I_2$ and $10^{-3} KI + 10^{-2} M TTA$ (5-methyl benzotriazole). This slurry leads to low removal but high degree of planarization. More testing is being performed by Seun-Mahn.

Slurry II (High Removal rate (HRR)) consisting of $10^{-2} N I_2 + 10^{-3} KI + 10^{-3} TTA$ which gives higher removal rate for copper

Following experiments are being conducted for both slurries

- ① Polishing on patterned and blank copper wafers for different times (30 sec, 1 min and 2 min).

This will confirm how good the slurry will perform. The slurry is actually a solution without any particulate material.

In the future we plan to add some of particles such as pyromic particles so that we can remove copper residuals on wafers which are not perfectly flat.

In all these polishing a surface film is formed which needs to be removed.

These experiments are being done to reconfirm the efficacy of the slurry.

continued →

SIGNATURE Seun-Mahn Lee
READ AND UNDERSTOOD Seun-Mahn Lee

DATE Mar 25 2001
DATE Mar 26 2001